

**Tennessee Department of Environment and Conservation**  
**Proposed Final Version of the 2014 303(d) List**  
**Summary of Public Comments and Departmental Responses**

(Note: in some instances, public comments have been summarized  
in order to group similar observations by multiple reviewers.)

**General Comments**

**Comment 1.** *In previous version of the list, TDEC had a table in which agencies and entities that contributed data to the reassessment of Tennessee's waters were listed. What happened to this table?*

**Response:** There are so many agencies, environmental groups, college professors, members of the regulated community, and other contributors of data to this process that it would not be possible to create a table of all of them. The Assessment Database (ADB) used to store assessment information has become the place where data contributors are identified.

Certainly, we are indebted to our sister agencies such as the Corps of Engineers, the U.S. Geological Survey, U.S. Fish and Wildlife Service, National Park Service, Tennessee Valley Authority, the Tennessee Department of Agriculture, and the Tennessee Wildlife Resources Agency for their continuing contributions to water quality research.

**Comment 2.** *Could the cause "temperature alterations" be considered for Category 4c (a pollutant not suitable for the TMDL approach), especially when the source is an upstream impoundment?*

**Response:** Rapid, frequent, and dramatic water temperature changes downstream of impoundments is a common cause of impacts to aquatic life in Tennessee. In other parts of the country, temperature TMDLs have been developed to address this issue, so we're not sure Category 4c is appropriate.

**Comment 3.** *Are "thermal modifications" and "temperature alterations" the same thing?*

**Response:** Yes. Both mean violations of Tennessee's temperature criteria. We will standardize this cause in the 303(d) List to be "temperature alterations" to be closer to the term used in EPA's Assessment Database (ADB), the tool we use to store assessment information.

**Comment 4. *The draft 303(d) List mentions the use of EPA’s Recovery Potential Tool (RPT). Please explain how this tool was used to select streams for monitoring.***

**Response:** There are over 60,000 miles of streams in Tennessee that we can account for in our current GIS databases and likely twice as many miles in the next higher resolution coverage. EPA developed the RPT to provide the states and other water resource agencies with a systematic approach to compare and prioritize watersheds for many different uses based on multiple indicator types.

The three indicator groups in the RPT are: stressors (such as previous impairment or the location of permitted dischargers), social (such as public lands or source water protection areas), and ecological (such as presence of aquatic species with special status). In utilizing the RPT for this process, staff chose features or attributes they wanted the tool to consider. Once the indicators were selected, the RPT utilized the data to rank HUC 12 watersheds based on the indicators chosen. The tool helped to identify which watersheds are the most stressed or have high ecological concern. Once the watersheds were identified, staff were able to select stream segments where additional information was needed.

While the RPT can rank watersheds based on any combination of factors, we were particularly interested in three kinds of streams.

1. Impaired streams that because of improving water quality and or the implementation of control strategies or BMPs, may be close to meeting water quality standards. In water resources jargon, these are the “low hanging fruit” for recovery.
2. Streams that are not impaired, but may have declining water quality that we could possibly reverse if we knew more about them.
3. Streams with high resource value or high public interest, streams that we cannot allow to go unassessed.

Utilizing the RPT as a part of our process, streams were selected and presented to field office staff as high priority future monitoring targets. Additionally, we can utilize this process to alert our partner agencies to assist in helping streams that are close to full recovery.

Our evaluation of the RPT has been favorable thus far and we consider it important to have a logical and scientific approach to developing monitoring and assessment plans.

**Comment 5. *The 303(d) List should include streams where TDEC has authorized degradation on the basis of “social and economic necessity” as allowed under the antidegradation policy. In these cases, degradation can be allowed based on projections of future employment or other economic benefits that may or may not come true. TDEC should track these economic predictions to ensure that water quality has not been lowered without the public actually benefitting from it.***

**Response:** We understand this comment and consider it to be primarily about the antidegradation policy. Clearly, if an applicant has provided a rationale for degradation to be allowed for the social or economic benefit of the public, they have an obligation to make reasonable projections likely to come true.

However, we can never authorize the condition of pollution, no matter the rationale or justification. If the applicant impacts uses of the stream, they are in violation of their permit and listing the stream on the 303(d) List would be appropriate. But not simply because degradation had been authorized.

**Comment 6. *The percentage of streams considered “not assessed” in Tennessee indicates that the department should allocate additional resources to monitoring so that all streams can be assessed. Volunteer monitoring programs should be expanded.***

**Response:** Like the commenter, we would like to increase the number of miles assessed for water quality in Tennessee. However, with over 60,000 miles of streams and finite resources, it is unlikely that we'll ever be able to assess every stream. The key to increasing the number of assessed miles will be to more easily share data between all the agencies and entities that collect it. Additionally, we have placed stream monitoring requirements in an ever-increasing number of NPDES permits.

Volunteer monitoring is an important source of information and citizens reports of pollution events are already an important “early warning system” that we utilize every day. We provide guidance on our website regarding how citizens may collect stream data and submit them for our consideration. In order to be used to assess streams (rather than be used as a screening tool) data submitted would have to meet specific quality assurance measures and objectives. Additionally, we request that data submitters provide clear information about the location and times samples were collected and where and how they were analyzed.

**Comment 7. *Tennessee should not use rain event pathogen sampling to assess streams, especially for pathogens.***

**Response:** Our sampling SOP suggests that field staff not collect samples if streams are over “bankfull” flows. We additionally ask field staff to identify rain event samples in the database so that information can be taken into consideration. Our water quality standards, plus our assessment understanding with EPA, allow us to give rain-event pathogen data “less weight” in assessment decisions, but we cannot disregard these data.

### **Specific Comments**

**Comment 8. *Pigeon Roost Creek (TN05130108045\_0450) upstream from the Cookeville municipal point source should be delisted for nutrients. (Data provided by commenter in support of comment.)***

**Response:** According to EPA, there are several acceptable reasons for delisting a stream. These reasons include changes in water quality criteria and assessment methods, or that an error was made, such as improper application of classifications or criteria. As none of these apply to Pigeon Roost Creek, the remaining acceptable reason for delisting is that a water quality criterion previously violated is now being met. To explore this possibility we reviewed the data collected in Pigeon Roost Creek.

The regional numerical interpretations of the narrative nutrient criterion used by the division while assessing streams are based on the 90<sup>th</sup> percentile of the pooled reference stream data. In Subcoregion 71g, where Pigeon Roost Creek is located, the interpretations are 0.92 mg/L NO<sub>2</sub>+NO<sub>3</sub> and 0.03 mg/L for total phosphorus.

Regarding NO<sub>2</sub>+NO<sub>3</sub>: in 2012-2013 TDEC sampling at mile 2.6 (upstream Cookeville STP), nitrate+nitrite levels ranged from 0.92 – 3.9 mg/L, with a mean level of 1.39 mg/L. In other words, there wasn’t a single observation collected by TDEC lower than the 90<sup>th</sup> percentile of the pooled reference stream data.

Regarding total phosphorus: at that same station, levels ranged from 0.013 – 0.29 mg/L, with a mean level of 0.064, also higher than the 90<sup>th</sup> percentile of the reference stream data.

However, the assessment of nutrient impairment does not solely hinge on water concentrations. The Division has performed three biological surveys in upper Pigeon Roost Creek since 2011. In each of these benthic surveys, the effects of nutrients were evident, both in the elevated number of genera considered “nutrient tolerant” and in the reduced number of non-nutrient tolerant EPT genera.

Based on the review of these data, we do not believe that we can construct a reasonable rationale for delisting this segment of Pigeon Roost Creek for nutrients.

**Comment 9. *Pigeon Roost Creek (TN05130108045\_0400) downstream of the Cookeville municipal point source should not be listed for nutrients as the elevated concentrations are not causing harm. (Commenter provided 2002 algal growth study as support for this position.)***

**Response:** The original 303(d) listing of Pigeon Roost Creek for nutrients was appealed to EPA. Region 4 staff stated at the time that not only was the listing appropriate, but had TDEC not listed the stream for nutrients, EPA would have.

As the stream is already listed, a rationale for delisting would need to be on the basis that the water quality standard is now being met. We are not aware of any data demonstrating this to be true.

**Comment 10. *A segment of Round Lick Creek in Wilson County (TN05130201021\_2000) is identified as impacted by discharges from a municipal point source (Watertown STP). The commenter has observed the stream further downstream from this segment and supplied pictures indicating the presence of heavy algae concentrations. Do the impacts of nutrients extend further downstream than the listed segment?***

**Response:** The commenter is correct and the submitted photographs accurately illustrate conditions. In 2010, TDEC performed a semi-quantitative, single habitat (SQSH) survey at mile 16.0 (u/s Commerce Church Road). This station is downstream of the segment currently identified as impacted.

At this new station, the SQSH documented 8 EPT genera and 22 total genera. This resulted in a Tennessee Macroinvertebrate Index score of 28. While the number of genera was not bad for this subcoregion (71i), 83 percent of the genera are considered to be “nutrient tolerant,” a strong indication of impacts.

As a result of these data, we will extend the downstream boundary of this segment from the current point of Haley Branch to the confluence of Big Caney Branch.

**Comment 11. *An Unnamed Trib to Cheatham Reservoir (TN05130202021001T\_0600) is identified as being in Davidson County. It is actually in Sumner County.***

**Response:** The commenter is correct and we will make this revision.

**Comment 12.** *In the assessment of Mill Creek (TN05130202007\_1000) as impaired by pathogens, TDEC's data appear to have been influenced by a non-reoccurring sewer overflow in June, 2010.*

**Response:** We looked at the overflow reports carefully in making this assessment. As there are still sewer overflows near the mouth of Sims Creek, we felt it was proper to list this stream. Also, it should be noted that as an Exceptional Tennessee Water due to the presence of the federal-listed Nashville crayfish, a lower pathogen criterion applies to Mill Creek.

**Comment 13.** *In the assessment of Mill Creek (TN05130202007\_5000) as impaired by pathogens, the data appear to have been influenced by the May 2010 historical flood.*

**Response:** The data in question were collected in August 2010, three months after the flood. Also, it should be noted that as an Exceptional Tennessee Water due to the presence of the federal-listed Nashville crayfish, a lower pathogen criterion applies to Mill Creek.

**Comment 14.** *A commenter has pathogen data on Ewing Creek (TN05130202010\_0900). Also, TDEC appears to have used data collected in the aftermath of the May, 2010 flood to continue to list this stream.*

**Response:** We agree that we should not use data collected during the historical May 2010 flood to assess streams. We collected 19 E. coli samples in Ewing Creek and three of them exceeded the single sample max. We agree that the data are very borderline, but would like to continue to watch the stream through one more assessment cycle, rather than delist at this time.

**Comment 15.** *A commenter has pathogen data on the lower section of Whites Creek (TN05130202010\_1000). The water quality criterion for the four geo mean samples was met in fall, winter, spring, and summer. Also, the old sewage pumping station on Whites Creek that suffered from chronic overflows has been replaced by a new facility. There have been no overflows from this new facility since it was put online.*

**Response:** We agree with the commenter that the stream can be delisted for pathogens. Beyond that, we also believe that in light of the elimination of overflows, the existing water contact advisory on Whites Creek can be lifted. This is an outstanding success story and we are pleased to add this stream to Appendix A.

**Comment 16. *What is happening on Stoner Creek (TN05130203035 – 1000) in Davidson County to eliminate the overflows from the collection system?***

**Response:** According to Nashville's Metro Water Services, a project was recently completed at the Dodson Chapel Pump Station to construct an 11 million gallon (MG) equalization basin. In conjunction with the previously constructed 3 MG basin, the project will greatly improve the ability to manage wet weather flows by providing increased reliability and pumping capacity to the equalization basins. A separate project has been designed to provide additional trunk sewer flow capacity to the pump station. Following the acquisition of needed easements and permits, this trunk sewer improvement will further address wet weather discharges into Stoner's Creek.

**Comment 17. *A commenter has pathogen data on Pages Branch (TN05130202202\_1000). The water quality criterion for the four geo mean samples was met in spring, fall and winter, but exceeded in summer. DNA analysis indicates that the pathogen sources were not human. This stream could be delisted.***

**Response:** Because the geo mean criterion was exceeded in summer (195.0 cfu) when people are most likely to be in contact with the stream, it would be difficult to construct an argument that the criterion is being met. Additionally, the criterion does not specify that it only applies to human pathogen sources.

**Comment 18. *A commenter has pathogen data on Cooper Creek (TN05130202209\_1000). The water quality criterion for the four geo mean samples was met in summer, fall and winter, and just barely exceeded in the spring. DNA analysis indicates that the pathogen sources were not human. This stream could be delisted.***

**Response:** We must also take into account our data from this stream. An August 2010 TDEC geo mean of 6 E. coli observations was 194.8 cfu. A May-June 2011 geo mean of 6 E. coli observations was 327.6 cfu. Both of these observations were violations of the pathogen criterion.

**Comment 19. *A commenter has pathogen data on Gibson Creek (TN05130202212\_1000). The water quality criterion for the four geo mean samples was met in spring, summer, fall and winter. DNA analysis indicates that most of the pathogen sources were not human. There has been significant amounts of sewer maintenance in this watershed, which***

***may be the reason pathogen levels are lower. This stream could be delisted.***

**Response:** We agree with the commenter and will move this stream to Appendix A for pathogens.

**Comment 20.** ***A commenter has pathogen data on the lower section of Walkers Creek (TN05130202220\_0200). The water quality criterion for the four geo mean samples was met in fall and winter, but just barely exceeded in spring and summer. DNA analysis indicates that the pathogen sources were not human. This stream could be delisted.***

**Response:** The fact that the geo mean criterion was exceeded in half the samples would make it difficult to argue that the criterion is now being met. Additionally, the criterion does not specify that it only applies to human sources.

**Comment 21.** ***A commenter has pathogen data on the lower section of Manskers Creek (TN05130202220\_1000). The water quality criterion for the four geo mean samples was met in fall and winter, but not met in spring and summer. DNA analysis indicates that the pathogen sources were not human. This stream could be delisted.***

**Response:** The fact that the geo mean was exceeded in half the samples would make it difficult to argue that the criterion is now being met. Additionally, the criterion does not specify that it only applies to human sources.

We must also take into account our data from this stream. An August 2010 geo mean of 6 E. coli observations was 129.5 cfu. A May-June 2011 geo mean of 6 E. coli observations was 1013.4 cfu. The 2011 geo mean was well above the criterion (126 cfu).

**Comment 22.** ***A commenter has pathogen data on the upper section of Manskers Creek (TN05130202220\_2000). The water quality criterion for the four geo mean samples was met in the summer, fall and winter, but not met in spring (290 cfu). DNA analysis indicates that the pathogen sources were not human. Also, the commenter's dissolved oxygen data indicate the water quality criterion is being met. This stream could be delisted.***

**Response:** The fact that the geo mean criterion was exceeded in a quarter of the samples would make it difficult to argue that the criterion is now being met. Additionally, the criterion does not specify that it only applies to human sources.

We must also take into account our data from this stream. A TDEC August 2010 geo mean of 6 E. coli observations was 408.9 cfu. A May-June 2011 geo mean of 6 E. coli observations was 1602.5 cfu. Both geo means were well above the criterion (126 cfu). Also, we recorded numerous DOs lower than 5.0 mg/L.

**Comment 23.** *The Stones River downstream of Percy Priest Reservoir (TN05130203001\_1000) is currently listed for low dissolved oxygen with the source identified as “upstream impoundment.” The Corps of Engineers has made modifications to the dam structure and operation changes that have improved oxygen levels downstream of the dam. Could this listing be reconsidered based on new data?*

**Response:** Yes. The Stones River is a Group 2 watershed scheduled for reassessment in the fall/winter of 2014. We would be happy to take a look at these new data and reconsider the listing as appropriate.

**Comment 24.** *Bear Branch in Rutherford County (TN05130203023\_0310) is identified as impacted. The Corps of Engineers did a watershed management study for the city of Murfreesboro and found that there is a sink upstream of TDEC’s sample location at Compton Road. Since streamflow may continue to be an issue at Compton Road, could TDEC’s station be moved upstream?*

**Response:** Yes. In the meantime, we could review data collected by the city or the Corps that might shed additional light on the water quality status of this stream.

**Comment 25.** *TDEC has proposed delisting Cartwright Creek (TN0513020401009\_0500), a tributary to the Harpeth River. It was previously listed due to habitat alterations. Overflows from a nearby sewage treatment plant may still be impacting the stream, so it should remain listed.*

**Response:** Cartwright Creek recently passed both types of biological tests commonly used by the department. It scored an 11 on a biorecon and a 32 on a semi-quantitative, single habitat survey (SQSH). Both of these scores are passing and it is appropriate to delist this stream if it was previously considered to not support fish and aquatic life.

Cartwright Creek is not currently assessed for recreation.

**Comment 26.** *A commenter believes that “collection system failure” should be added as a source to the following streams in the Harpeth River watershed: Sharps Branch, Watson Branch, Spencer Creek, South Prong Spencer Creek, Unnamed Trib to Harpeth River, and Harpeth River section (TN05130204016\_2000).*

**Response:** Of the streams suggested by the commenter, only the Harpeth River and Spencer Creek are currently listed as impacted by pathogens. Until we determine that the criterion is being violated, it would be premature to assign sources. Regarding the two streams that are currently listed, we do not believe that the frequency of overflows justifies naming the collection systems as a significant source. For example, the April 2014 overflow of 65,250 gallons into the Harpeth River at Pinkerton Park cited by the commenter is unfortunate and undesirable, but would not by itself prove impairment, due to the much larger flows in the river at the time.

We think that sources related to urban stormwater are more significant in these watersheds. However, if new data indicate this is not correct, we will make revisions.

**Comment 27.** *A commenter believes that nitrate+nitrite should be added to the causes assigned to multiple sections of mainstem Harpeth River, with municipal point source discharges as source.*

**Response:** When assessing this watershed, we looked at nutrient levels carefully. Clearly, nitrate+nitrite levels in the Harpeth are not of the same magnitude as total phosphorus. It appears to us that the commenter applied the division’s regional numeric interpretation (0.92 mg/L) of the narrative nutrient criterion as if it was an acute, not to be exceeded criterion. According to our guidance, the regional number is more like a chronic criterion to be compared to average nutrient levels.

We consider the nutrient of concern in the Harpeth River to be primarily total phosphorus.

**Comment 28.** *Mossy Creek in Jefferson County (TN06010104004T\_2600) is identified as impacted by zinc. Data collected by the commenter indicates that the hardness-based zinc water quality criterion is currently being met in Mossy Creek. (Data submitted in support of comment.)*

**Response:** We agree and note that the commenter’s data agree with those recently collected by the division. We will propose delisting this stream for zinc, however, it will need to remain listed for other pollutants.

**Comment 29.** *If the Pigeon River at the North Carolina stateline (TN06010106001-4000) is listed as impacted by color, then the French Broad River (TN06010105001\_1000) near Newport should also be listed. It also has elevated levels of color.*

**Response:** The commenter is comparing streams and monitoring stations in two different ecoregions, thus expectations would be different. The impaired section of the Pigeon is in the Blue Ridge Mountains ecoregion (66), an area known for extremely clear streams. The French Broad River monitoring station in question is in Ecoregion 67 (Ridge and Valley) where streams tend to carry higher levels of silt and color.

The color in the French Broad is due to very fine colloidal, milky silt from historical rather than current mining activities in North Carolina. These fines are stirred up during flow events and appear as true color in tests. Since there have been no reports of “objectionable color,” this stream is not considered impaired for that. We have assessed the French Broad as impaired by siltation in the past, as there is no doubt that it has been impacted by activities in North Carolina.

**Comment 30.** *The Pigeon River at the North Carolina stateline is listed as impacted by color. The average levels of true color in the river each year do not violate Tennessee’s narrative criterion.*

**Response:** As noted by the commenter, Tennessee’s color criterion under the recreational use is narrative:

“There shall be no total suspended solids, turbidity or color in such amounts or character that will result in any objectionable appearance to the water, considering the nature and location of the water.”

Since the basis for interpreting the criterion is “any objectionable” amounts of color, average levels over time would not be an accurate measure of compliance. The magnitude, frequency and duration of occasions in which the color was objectionable would be the proper approach and is the basis for the current listing.

**Comment 31.** *The number of rafters utilizing the Pigeon River is increasing over time. This indicates that the recreational use is now being met.*

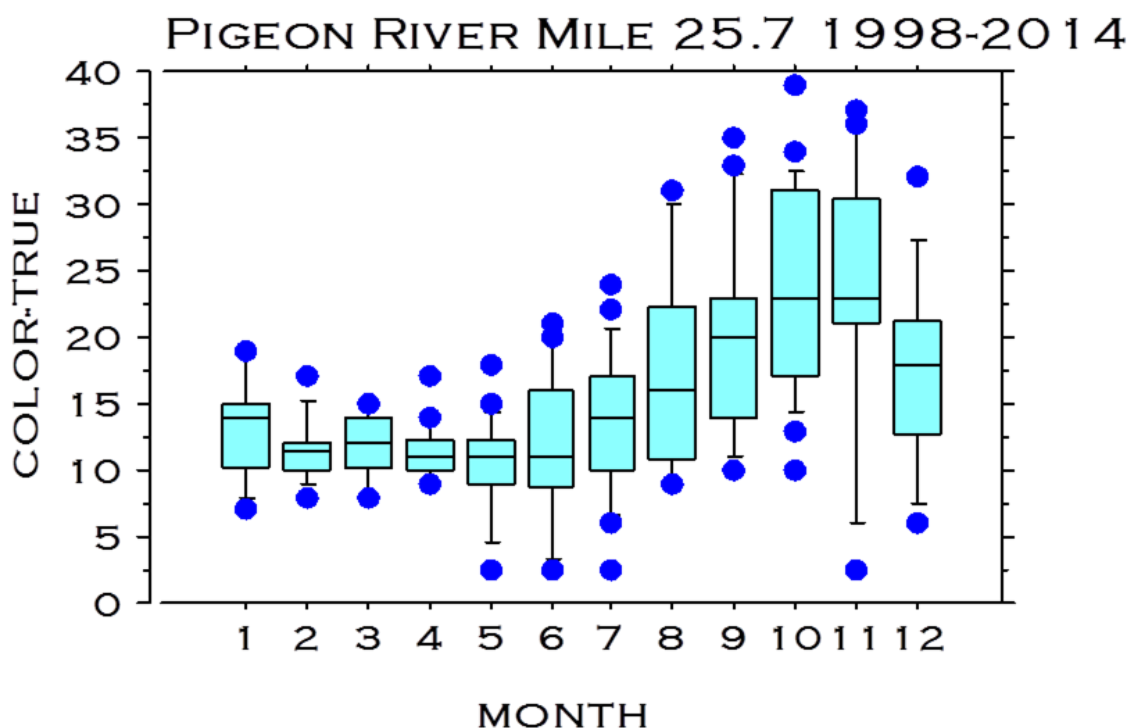
**Response:** Tennessee agrees that conditions in the Pigeon have improved and that recreational use has increased. However, as indicated in the previous

response, the basis for interpreting the criterion is “any objectionable” amounts of color rather than the number of rafters.

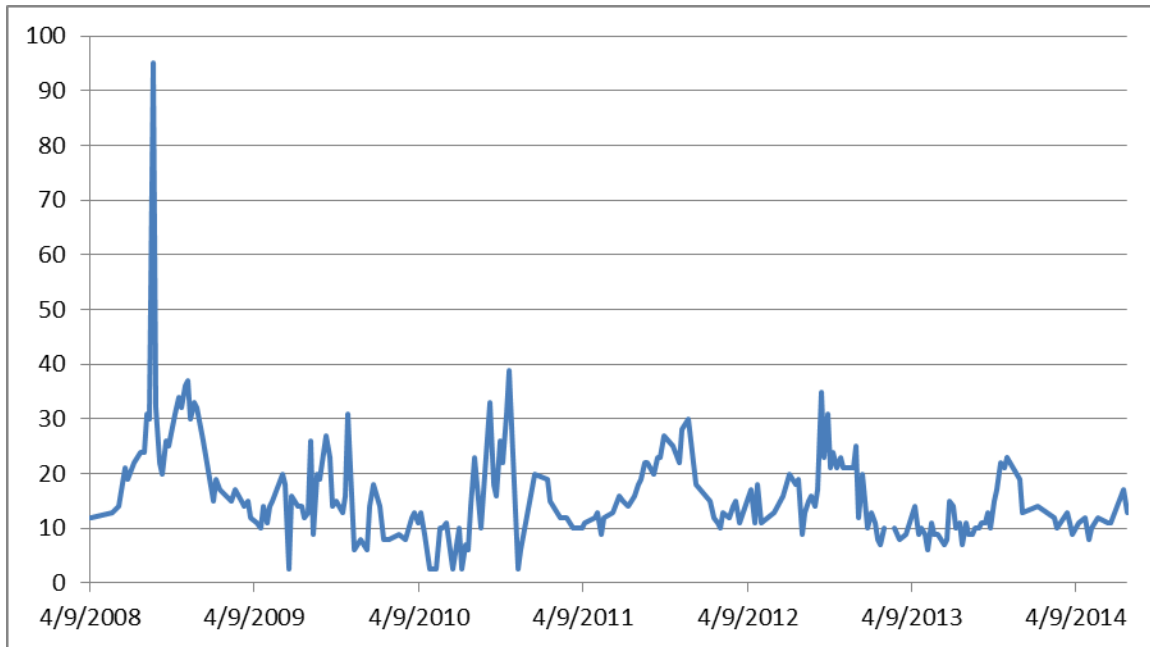
**Comment 32. Color levels on the Pigeon River (TN06010106001-4000) are no longer objectionable. The section should be delisted.**

**Response:** Color levels have greatly improved in the Pigeon River during the last twenty years, progress noted and appreciated in Tennessee. As a result, a much smaller section of the Pigeon is currently listed as compared to historically, when the entire river was listed for color. The 2014 version of the List only includes the section between Hartford and the stateline as impacted by color.

The following figure illustrates monthly levels of true color in the Pigeon River at the stateline. As the figure illustrates, the levels of color in the Pigeon are highest during the recreational months.



It is fair to ask if color levels have improved significantly in recent years. Based on true color data collected between 2008 and the present at the stateline, the answer appears to be that there has not been a substantial change.



The Pigeon River was listed for color in the 2012 version of the 303(d) List. If Tennessee were to propose delisting the Pigeon in 2014, we would have to answer the fundamental question “what has improved?” The data would not support a rationale based on recent improvements in color levels.

Recreational users, which include visitors, local residents, and elected officials, have told us that the color is still objectionable at times. Department field staff and staff from other agencies have also told us that the color is still objectionable. Since the criterion is based on “any objectionable” color, we would not be able to recommend delisting, since the criterion is still being violated.

**Comment 33. *Tennessee's reference stream approach is flawed. Comparing the Pigeon River to the water quality in small streams devoid of human activities is not a fair comparison.***

**Response:** Reference streams, by definition, are the least-impacted representative condition that can be found within an ecoregion. It is appropriate to use comparisons to these least-impacted streams to gauge impacts to other streams due to human disturbance. Unimpacted Blue Ridge Mountain streams tend to be a very high quality and our reference streams in Ecoregion 66 reflect this.

Tennessee has used reference stream data to develop regional interpretations of narrative criteria for nutrients, dissolved oxygen, pH, biological integrity, and habitat. Where we have used the reference approach to interpret criteria, there has been no requirement that test streams be exactly the same as reference

streams, just that they not be significantly different than the reference condition (the pooled reference data).

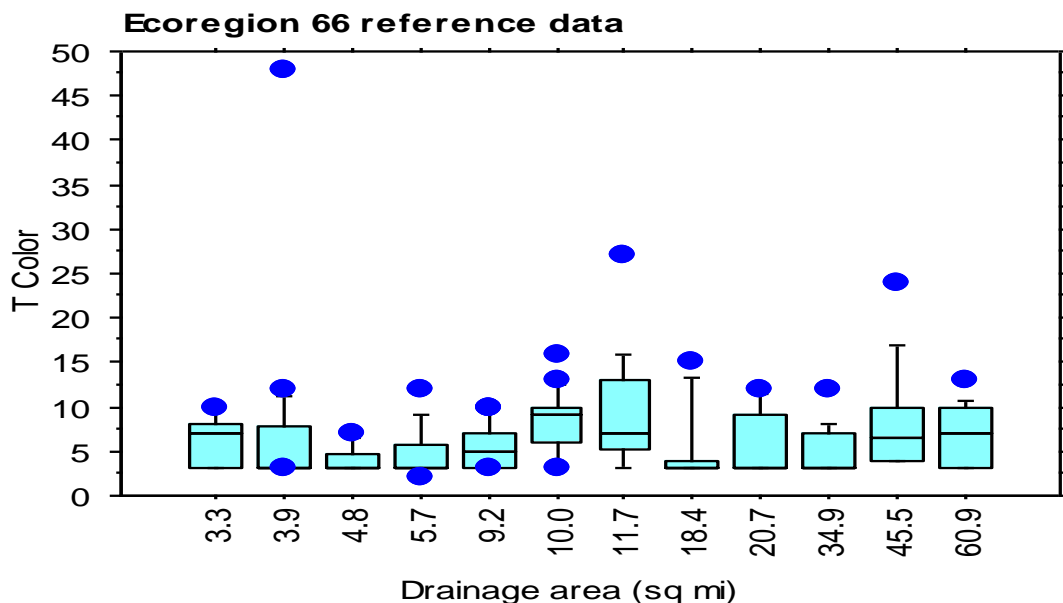
EPA has consistently approved our use of reference stream data to develop water quality standards in Tennessee as being consistent with federal requirements. We are confident that our approach is scientifically appropriate and legally defensible.

But as stated in a previous response, the basis for the listing of the impaired section of the Pigeon is that the color is objectionable at times.

**Comment 34. *Tennessee's reference streams in Ecoregion 66 are within 13 different basins of different sizes, which are not comparable to the Pigeon River.***

**Response:** All of our reference streams are within Ecoregion 66 as is the Pigeon River. Additionally, all are wadeable. (The Pigeon is wadeable at the stateline except when the powerhouse is generating.) However, the commenter is correct when noting that the reference streams are smaller than the Pigeon.

However, stream size in undisturbed systems does not appear to be a factor in true color levels. When comparing the reference streams by drainage (following figure), the median value for the stream with the smallest drainage was higher than those with the largest, while ranges were similar.



We also considered the Little Tennessee River which is even larger than the Pigeon, yet still meets reference condition. This indicates that the reference condition is attainable in Ecoregion 66, even in larger streams.

**Comment 35. *Tennessee's reference streams approach is flawed because the individual streams within the database are not similar. Each stream is not sampled enough times. There is less variability in the reference stream database than in the Pigeon River database. All these things make it an unfair comparison.***

**Response:** We do not agree.

First, it is not the objective of the reference approach to compare individual reference streams to the comparison stream. Rather, reference data are designed to be pooled when determining guidelines. By using a range of reference sites over time, there is a better representation of least-impacted conditions than multiple data points from a single site. The pooled data are used to determine reference condition.

Second, the reference streams are not intended to be statistically similar. They are selected to represent the range of conditions in least-impacted, but representative, streams within the ecoregion. In this way, we are not biasing data toward the very best reference stream, since there are always some reference streams that are different than others, thus capturing the variability that exists between high quality streams in the same subcoregion.

When pooled, the Ecoregion 66 reference stream database represents 15 years of data (1998 – 2014) with every season and all 12 months represented.

**Comment 36. *Tennessee only samples reference streams during dry conditions. That approach biases data towards good results.***

**Response:** Our sampling follows an established departmental SOP. According to the SOP (*TDEC Quality System Standard Operating Procedure for Chemical and Bacteriological Sampling of Surface Water*), “Unless the study design requires flood or post-flood sampling, avoid sampling in flooded conditions or immediately after a flood.”

This policy is repeated in the department’s *Quality Assurance Project Plan (QAPP) for 106 Monitoring*:

In the event of flood or high water episodes, sampler safety is of paramount importance. Unless the sample is needed for TMDL development, sampling during flood events (when water is out of banks) should be avoided. If sampling during a flood event cannot be avoided, it is noted on associated paperwork and remarks section of Chain of Custody that the sample was collected during a rain or flood event, so the results can be evaluated accordingly. Field staff notify PAS so data are

flagged with an R in the Water Quality Database.

Chemical and bacteriological samples are not collected if the stream only has water in isolated pools. Biological samples are not collected if the water level is extremely low or it appears the waterbody has not had continuous flow for at least 30 days.

These protocols are followed by TDEC staff and are referenced in NPDES permits requiring surface water sampling by the regulated community.

The goal of this policy is to help ensure that data are representative and not skewed by results influenced by flood or near-flood conditions where the stream is at or above bank-full. This protocol is not restricted to reference data but applies to all sampling. For example, Pigeon River samples were not collected by TDEC staff during flood events either.

This does not mean samples are not collected when flows are elevated or during normal rain events. Field staff are trained on protocols, including how to differentiate between flood and high flow. If samples are inadvertently collected in flood or near-flood conditions, we include them in our database with a qualifier (R). Caution is used when evaluating the data to ensure assessments are not biased by atypical events.

The SOP also addresses abnormally dry conditions and states that samples should only be collected when water at the site is flowing, as monitoring stagnant water can lead to the appearance of impairment where none exists.

To illustrate the range of flow conditions that were collected at the ecoregion 66 reference sites, the following range of flow measurements were recorded at the same time color samples were taken in our largest streams (please note flow is not recorded every time samples are collected.):

Abrams Creek:	5.0 – 73.2 cfs
Beaverdam Creek:	8.8 – 103.3 cfs
Middle Prong Little Pigeon River:	11.4 – 159.3 cfs
Little River:	4.6 – 171.6 cfs
Citico Creek:	0.2 – 208 cfs

**Comment 37. *The department's sampling is "deliberately" intended to add "severe bias."***

**Response:** We do not agree. As stated in the previous comment, the department's SOP for chemical sampling applies equally to both reference streams and the Pigeon River. There is no bias intended and we do not believe it exists. Our sampling procedures are reviewed and approved by EPA staff.

**Comment 38. *The commenter commissioned the sampling of tributaries to the Pigeon and suggests that they are significant sources of color. (Report submitted to support comment.)***

**Response:** The tributaries may contribute some color, but are more likely sources of dilution for the color from industry.

It is important to note that we have significant reservations about the way the study's samples were collected, including those from tributaries. In a previous color perception report from 2013, it was revealed that samples were collected by tossing a bucket from the bank and pulling it back to the sampler by rope. This technique greatly increases the possibility that the sample will be contaminated by sediment in the water column due to the sampling method, rather than by ambient conditions.

This bucket technique appears to be pictured in the submitted Figure 1-16, labeled as "Murray Branch near Thickety Road in Canton." We may be misinterpreting this picture and would welcome an explanation regarding what the person pictured is doing, if not sampling.

**Comment 39. *Most of the loading of color to the Pigeon River is from the tributaries rather than from Evergreen.***

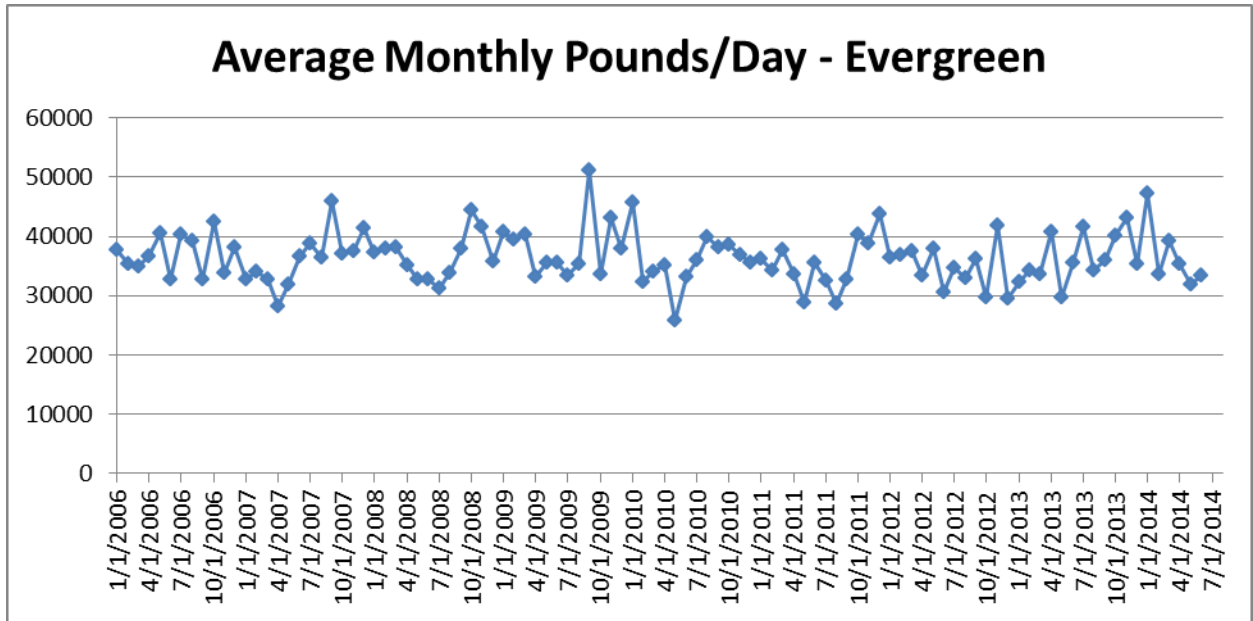
**Response:** If most of the color in the Pigeon comes from tributaries, then the true color concentration would increase downstream of Canton. It doesn't. The tributaries dilute the color and make it less objectionable, especially during high rainfall months.

See the previous response about our concerns regarding data collected during the study due to questionable sample collection techniques.

**Comment 40. *Even if the Pigeon remains listed for color, "Industrial Discharge" should be removed as a source. Also, the comment field for the Pigeon is the only instance in which a specific industrial discharger was identified.***

**Response:** We do not agree with this comment as we hardly consider a discharge that adds between 25 and 50 thousand pounds of color per day to the Pigeon River (see figure following) to be insignificant. The fact that the nearby Little Tennessee River has no color issue indicates that the color in the Pigeon is anthropogenic, since these streams are similar in most other ways.

Additionally, color concentrations peak directly below the mill, indicating that it is the dominant source of color.



A Word search of the document indicates that in many other cases, a specific industrial source other than Evergreen was named in the comment field for 303(d) listings. Removing a source of this magnitude from the list would not be consistent with the process used to inventory sources in other impaired streams.

**Comment 41.** *The assignment of a TMDL priority for color in the Pigeon River should be removed since the stream is not impaired.*

**Response:** As a Category 5 stream, a TMDL would be appropriate.

**Comment 42.** *Flow has been restored to the “bypass” section of the Little Tennessee River (TN06010204020 – 1000) currently considered impacted by flow alterations downstream of Calderwood Reservoir. Flows have been restored and the river’s biology has returned (biological report submitted). This stream could be delisted from the 303(d) List.*

**Response:** We agree with the commenter that significant progress has been made in restoring uses in this section of Little Tennessee River. Our review of the report submitted by the commenter leads us to the view that the fish and aquatic life use may not be fully restored yet. For example:

- Bedload movement smothered translocated mussels at site 4 – the site was abandoned due to periodic bedload movement throughout study.
- 2,000 juvenile creekshell mussels were released at site 3, but subsequent studies indicated no propagated cohort detected.
- 28,600 juvenile mucket and pheasantshell mussels were released at sites 3 and 5, but no evidence of survival.
- Retention of fluted kidneyshell and kidneyshell mussels initially appeared high, but declined each year post stocking, especially in females.
- Growth declined and the ability to reproduce was compromised throughout the study for fluted kidneyshell and kidneyshell mussels.
- Only one out of 1,161 fish examined had attached glochidia (juvenile mussels).

The Tennessee Wildlife Resources Agency has agreed to conduct a fish and benthic survey in the river. We can revisit this listing in the future. Again, we applaud the effort and results obtained thus far. We are particularly happy about the successful reintroduction of the Cumberland moccasinshell.

**Comment 43.** *The discharge of the Madisonville STP is identified as impacting Bat Creek (TN06010204004\_2000). However, the STP discharges to an unnamed tributary. Shouldn't the unnamed tributary where the discharge is located be listed also?*

**Response:** We looked at detailed maps and aerial views and the commenter appears to be correct. The discharge of the sewage treatment plant is to an unnamed tributary to an unnamed tributary of Bat Creek. However, Bat Creek downstream of the unnamed tributary is still impacted by the discharges from the facility, so only the segment size of that listing will be modified.

We will create segments for the unnamed tributaries to Bat Creek (TN06010204004\_0100 & 0110), and will add listings for each.

**Comment 44.** *Water quality in Cane Creek (TN06010204044\_0100) in Monroe County has improved to the point that the stream could be*

***delisted. (The commenter provided a table containing the comparison of a single sample result for nitrogen, phosphorus, and E. coli from 2008 compared to a single sample result from 2013.)***

**Response:** Cane Creek is considered fully supporting for fish and aquatic life and nutrients are not listed as a cause on the draft 303(d) List. Regarding E. coli: the stream is currently listed due to elevated pathogen levels going all the way back to 2003. In 2008, the geometric mean on five E. coli samples collected within a 30 day period, was 377 cfu. (The criterion is 126 cfu.) In contrast, in 2013, levels were comparatively low with a geo mean of five samples being 6.6 cfu.

The amount of data collected in 2013 is not sufficient to have confidence in a delisting decision at this time. We will do additional sampling in the future to attempt to confirm water quality improvements.

**Comment 45. *Tellico Reservoir has had a long-standing PCBs advisory for catfish and several years ago, a mercury advisory for largemouth bass was added. Fish tissue data collected in 2013 by the Tennessee Valley Authority indicate that the levels of these pollutants are coming down. (Commenter provided tables and graphs of fish tissue data.) TDEC should take this opportunity to remove the fishing advisories and delist the waterbody.***

**Response:** We agree with the commenter that the trends in fish tissue contaminants in the Tellico River appear to be hopeful, but we consider it premature to consider removing the advisory and as long as the advisory is in place, the lake will need to be listed. Environmental data vary and as recently as 2009, PCBs were elevated in fish collected near the dam. (Unfortunately, PCBs were not analyzed in TVA samples collected in 2011.)

Fish will be collected again in 2015 and this issue can be revisited. We understand that local residents would like to see this advisory removed, but TDEC must be certain that contaminants are within safe levels before stating publicly that they are.

**Comment 46. *Big Creek (TN06010205064 – 2000) in Campbell County is identified as impacted by the source “Discharges from MS4 Area.” There are no MS4 programs in Campbell County.***

**Response:** The commenter is correct and we will make this revision. We'll change the source to “Urbanized High Density Area.”

**Comment 47. *The proposed delisting of Emory River segment TN06010208001\_2000 due to the removal of coal ash from the river is inappropriate. The Emory Embayment of Watts Bar will continue to be impacted due to the Kingston Ash Spill.***

**Response:** The release of 5.4 million cubic yards of coal ash on December 22, 2008 impacted the Emory River embayment in several ways. The most obvious was the physical impact of the blockage of the channel and several embayments with ash. Additionally, levels of arsenic and aluminum dramatically increased in the water column. The physical and chemical impacts of the ash spill were documented in the 2010 303(d) List, which was approved by EPA.

In the years since the spill, TVA completed all the dredging of the ash from the river required of them by EPA and TDEC. As a consequence, levels of aluminum and arsenic have been reduced and no longer violate water quality standards. We consider it appropriate to delist the river for these specific pollutants.

**Comment 48. *The proposed delisting of Emory River segment TN06010208001\_2000 due to the removal of coal ash from the river is appropriate. However, the rationale in Appendix A should make it clear that the DOE facilities at Oak Ridge are the sources of the contaminants causing the existing fishing advisories.***

**Response:** As part of Watts Bar Reservoir, the current fishing advisory in the Emory Embayment of Watts Bar Reservoir is due to elevated levels of PCBs in fish tissue. Chlordane and mercury are elevated and included in the 303(d) List, but not named in the original fishing advisory. There is a mercury advisory upstream of the embayment on the Emory.

The department has always been clear that the DOE facilities have been a significant contributor of PCBs and mercury to Watts Bar. We are not aware that DOE has released significant amounts of chlordane, which was widely used for residential termite control.

However, in fairness, we point out that the Clinch is the receiving water for the DOE discharges. The Emory is a tributary to the Clinch. We are aware that the operation of the Kingston TVA facility draws water from the Clinch a short distance up the Emory. But the mercury advisory in the Emory is well upstream of Kingston. We have identified the most likely source of this mercury as “atmospheric deposition.” We will clarify the delisting rationale, but without citing DOE as the sole source, which we would not consider a reasonable or fair position to take.

**Comment 49. *The bioaccumulation of selenium in fish tissue in the Emory River is not adequately reflected in the assessment. There is still 510,000 cubic yards of ash left in the lake.***

**Response:** There was a concentrated effort by multiple agencies to monitor bioaccumulative substances in the Emory River following the ash spill. Neither water column sampling nor fish tissue analyses found selenium concentrations at harmful levels.

It was never considered feasible to remove all the ash lost into the river due to dispersal by rainfall events. As stated in a previous response, TVA dredged the amount of ash they were required to remove.

**Comment 50. *Is the old pulp and paper mill near Harriman impacting water quality in the Emory embayment?***

**Response:** We are not aware of any impacts. The mill has been out of operation for many years.

**Comment 51. *After being identified as threatened for several years, one of the sections of the Obed designated as a National Wild and Scenic River (TN06010208007-2000) has been assessed as impaired by excessive nutrients. The commenter agrees with this assessment due to the documented absence of previously occurring mussel species (particularly the purple bean), elevated conductivities, observed algal blooms, and the Obed's effluent dominated status at low flow.***

**Response:** The department shares the commenter's concern about the water quality status of this important river. We look forward to partnering with other agencies to find solutions to the point and nonpoint nutrient issues in the watershed.

**Comment 52. *Arrow Lake, an unnamed tributary to Arrow Lake, and Sugar Creek have been impacted by pollutants discharged from the landfill near Mt. Pleasant. The department should consider these pollutants as a higher TMDL priority than is currently indicated in the draft 2014 303(d) List. (The commenter included data, figures, historical information, and pictures to support the severity of the water quality issues in this watershed.)***

**Response:** The department shares the commenter's concern about water quality in the Sugar Creek watershed. However, the TMDL process is not always the best tool to use to address pollution issues. The site in question is under a 2012 Consent Order that requires the landfill operators to remove the contents of the

landfill and store the wastes in such a way that it will not come in contact with either ground or surface waters. Since this Consent Order has been developed, agreed upon by the parties, is being implemented, is enforceable, and will lead to compliance with water quality criteria, a TMDL would not be the preferred approach.

EPA has identified Category 4B for pollutants where an enforcement, permitting, or other process provides a better approach than a TMDL. Therefore, we will identify these pollutants as Category 4B and will explain in the comment field that a Consent Order is in place.

**Comment 53. *Big Muddy Creek (TN08010208007\_1000) in Haywood County is listed for total phosphorus with nonirrigated crop production identified as the source. The town of Stanton's lagoon discharges to an unnamed tributary to Big Muddy (TN08010208007\_0500). Is it not a source of phosphorus to the creek?***

**Response:** The commenter is correct. "Municipal Point Source" will be added to the current assessment for both the Big Muddy and the Unnamed Tributary.